

Amendments to the Drawings

The attached sheet of drawings include changes to Fig. 1. This sheet which includes Fig. 1, replaces the original sheet including Fig. 1. In Figure 1, the reference numeral 6b has been added.

Attachment: Replacement Sheet
 Annotated Sheet Showing Changes

REMARKS/ARGUMENTS

Reconsideration of this application in light of the above amendments and following comments is courteously solicited.

Claim 5 has been amended so as to depend from dependent claim 2 thereby providing antecedent basis for the term "the lens". Accordingly, it is submitted that the examiner's rejection of claim 5 under 35 U.S.C. 112, second paragraph is now moot.

Applicants submit herewith a new Figure 1 for substitution in the instant application. In Figure 1 the reference numeral 6b has been added so as to identify an opening 6b in the encapsulant 6. Page 13 of the specification has been amended to include reference to the reference numeral 6b identifying the opening.

Independent claim 1 has been amended so as to set forth that the encapsulant is formed of an opaque or semi-transparent resin and the encapsulant is provided with an opening through which the hole and an upper surface of the reflector are visible from outside of the plastic encapsulant. It is respectfully submitted that claim 1 as amended patentably defines over the art of record.

As defined in amended claim 1, the present invention is characterized by the following features:

1. Heat-resistible plastic encapsulant (6) is formed of opaque or semi-transparent resin for sealing at least an outer periphery of reflector (3), an upper surface of support plate (1), and each inner end of first and second wiring conductors (4, 5); and

2. Plastic encapsulant (6) has an opening (6b) through which hole (3a) and upper surface of reflector (3) are visible from outside of plastic encapsulant (6).

A semiconductor light emitting device provided with high power semiconductor light emitting element needs to have a heat radiating support plate for supporting the light emitting element thereon and a plastic encapsulant formed of heat-resistible resin. Typically such a plastic encapsulant is not a transparent resin, but opaque or semi-transparent resin, and so must be formed through a transfer molding technique to encapsulate support plate and a reflector mounted on support plate and around light emitting element and not to block off an optical path from light emitting element to outside of the device. In addition, when plastic encapsulant is formed by transfer molding technique, support plate and reflector have to be sandwiched between upper and lower molds to reliably prevent melt resin from entering the hole (3a) of reflector (3). In addition, this structure of the opening (6b) in plastic encapsulant (6) is superiorly advantageous in that it emits light from light emitting element (2) through opening (6b) to the outside of plastic encapsulant (6) formed of opaque or semi-transparent resin.

Honda: JP11340517A discloses a semiconductor light emitting device which comprises an insulating substrate 1 formed with wiring conductors 2 and 3; a semiconductor element 4 attached on a main surface 1a of substrate 1; a reflector 11 surrounding semiconductor element 4 on substrate 1; and a light-transmittable plastic encapsulant 6 for encapsulating semiconductor element 4 and reflector 11. Waitl et al: US2004/0201028A1 indicates a surface mounting optoelectronic component which comprises a base body 1 having a recess 4 formed therein; a semiconductor chip 11 arranged in recess 4 of base body 1; a liquid casting compound 14 filled in recess 4; and a plane-convex convergent lens 16 covering casting compound 14.

Loh: US2004/0126913A1 shows a light emitting die package which comprises a leadframe 20 including a plurality of leads 22a to 22e, top and bottom sides 24 and 26 and a mounting pad 28; a bottom heatsink 30 coupled to bottom side 26 of leadframe 20; and a top heatsink 40 coupled to top side 24 of leadframe 20 and formed with an opening 42 generally surrounding mounting pad 28. These references do not teach the features of amended claim 1.

Independent claim 13 calls for wiring conductor (5) electrically connected to light emitting element (2) through ledge (3d) of electrically conductive reflector (3) for easy and shortened wiring and improved reliability of wiring in semiconductor light emitting device. In this case, when ledge (3d) is clamped between upper and lower molds forming plastic encapsulant (6) during transfer molding, it serves to retain reflector (3) in position within cavity of molds. On the contrary, reflector 11 of Honda is formed of electrically insulating thermosetting resin such as liquid crystal polymer or ABS resin blended with white powder. Reference is made to paragraphs [0007] and [0015] of Honda. In fact, it should be noted that electrically insulating reflector 11 of Honda is arranged between wiring conductors 2 and 3 of anti-polarity. The Examiner's opinion that the reflector of Honda has a ledge connected to a wiring conductor to electrically connect the light emitting element and wiring conductor through the ledge is apparently based on a misunderstanding because Honda's reflector is non-conductive.

Both of independent claims 16 and 19 clarify shortened lead wire (8) which pass through notch (3k) of reflector (3) in the substantially linear configuration to electrically connect wiring conductor (5) and light emitting element (2), preventing warpage of lead wire (8). Unlike this, Honda's arrangement

represents lead wire 5 striding over reflector 11, as shown in figure 3 to connect an upper electrode of semiconductor element 4 and wiring conductors 3. Reference is made to paragraphs [0009], [0014] and [0025] of the specification.

In light of the foregoing, it is submitted that all of the claims as pending patentably define over the art of record and an early indication of same is respectfully requested.

An earnest and thorough attempt has been made by the undersigned to resolve the outstanding issues in this case and place same in condition for allowance. If the Examiner has any questions or feels that a telephone or personal interview would be helpful in resolving any outstanding issues which remain in this application after consideration of this amendment, the Examiner is courteously invited to telephone the undersigned and the same would be gratefully appreciated.

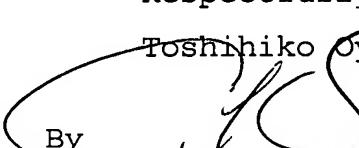
It is submitted that the claims as amended herein patentably define over the art relied on by the Examiner and early allowance of same is courteously solicited.

If any fees are required in connection with this case, it is respectfully requested that they be charged to Deposit Account No. 02-0184.

Respectfully submitted,

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By _____


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I, Rachel Piscitelli, hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313" on December 22, 2006.



1/17

図 1

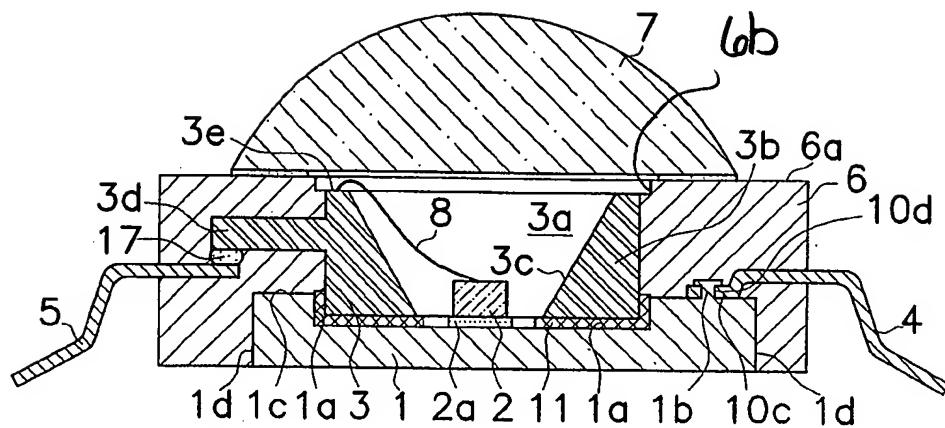


図 2

